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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/711,300	09/09/2004	Steven H. Voldman	BUR920040089US1	5299

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FREDERICK W. GIBB, III  
MCGINN & GIBB, PLLC  
2568-A RIVA ROAD  
SUITE 304  
ANNAPOLIS, MD 21401

EXAMINER

LINDSAY JR, WALTER LEE

ART UNIT	PAPER NUMBER
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2812

DATE MAILED: 04/05/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

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<b>Office Action Summary</b>	Application No. 10/711,300	Applicant(s) VOLDMAN ET AL.	
	Examiner Walter L. Lindsay, Jr.	Art Unit 2812	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) 13-22 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 8-12 is/are allowed.
- 6) ☒ Claim(s) 1,2,5 and 7 is/are rejected.
- 7) ☒ Claim(s) 3,4 and 6 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |  |
|--|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)            |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>9/27/2004</u> . | 6) <input type="checkbox"/> Other: ____  |

### **DETAILED ACTION**

This Office Action is in response to an Election filed on 1/7/2005.

Currently, claims 1-22 are pending. Claims 13-22 have been withdrawn.

### ***Election/Restrictions***

1. Applicant's election without traverse of claims 1-12 in the reply filed on 1/7/2005 is acknowledged.
2. Claims 13-22 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected method, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 1/7/2005.

### ***Specification***

3. The specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

### ***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claim 1, 2, 5 and 7 are rejected under 35 U.S.C. 102(b) as being anticipated by Lee et al. (U.S. Patent No. 6,190,954 dated 2/20/2001).

Lee shows the method as claimed in Figs. 4a-4c and corresponding text as: a substrate (11) of a first polarity (col. 3, line 21); a trench structure (31) in said substrate

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(col. 4, lines 3-7); a well region (12) of a second polarity abutting said trench structure (col. 3, line 26); and a heavily doped region of said second polarity (41) abutting said trench structure, wherein said heavily doped region having a dopant concentration greater than a dopant concentration of said well region, and wherein said heavily doped region is adapted to suppress latch-up in said integrated circuit (col. 3, lines 40-56) (claim 1). Lee teaches that wherein said heavily doped region comprises a sub-collector region (41) (the barrier layer acts in like manner to a sub-collector) (col. 3, lines 40-56) (claim 2). Lee teaches that a shallow trench isolation region, wherein said trench structure comprises a trench isolation region having a depth and a width, wherein said depth is at least twice as large as said width, and wherein said trench isolation region traverses said shallow trench isolation region (Fig 4a) (col. 4, lines 3-7) (claim 5). Lee teaches that a p+ anode (13) in said well region (col. 3, lines 29-31); a n+ cathode (14) in said well region (col. 3, lines 29-31); and a gate structure over said p+ anode and said n+ cathode (col. 3, lines 35-39) (claim 7).

***Allowable Subject Matter***

6. Claims 3, 4 and 6 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.
7. Claims 8-12 are allowed.

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8. The following is a statement of reasons for the indication of allowable subject matter: the prior art, either singly or in combination fails to anticipate or render obvious, the limitations of:

...further comprising a shallow trench isolation region, wherein said trench structure comprises a deep trench structure having a depth and a width, wherein said depth is at least twice as large as said width, and wherein said shallow trench isolation region is over said deep trench structure, as required by claim 3, as it depends from claim 1;

...wherein an aspect ratio of said depth to said width is at least 2.85, as required by claim 4, as it depends from claim 1;

...wherein an aspect ratio of said depth to said width is at least 2.5, as required by claim 6, as it depends from claim 1;

...p-type diffusion regions in said p-type substrate and in between successive ones of said STI regions;

a n-type retrograde well in said p-type substrate;

a deep trench isolation region bounding said p-type diffusion regions and said n-type retrograde well; and

a n-type sub-collector adjacent to a sidewall of said deep trench isolation region and below said STI regions, wherein said p-type diffusion regions, said n-type retrograde well, and said p-type substrate form a pnp parasitic bipolar transistor in said CMOS device, and wherein said deep trench isolation region and said n-type sub

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collector are adapted to suppress latch-up in said CMOS device that is caused by said pnp parasitic bipolar transistor, as required by claim 8.

**Conclusion**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Walter L. Lindsay, Jr. whose telephone number is (571) 272-1674. The examiner can normally be reached on Monday-Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael S. Lebentritt can be reached on (571) 272-1873. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Walter L. Lindsay, Jr.  
Examiner  
Art Unit 2812

WLL  
  
March 29, 2005